EdTech Startups and Their Impact on Traditional Learning Models

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Abstract

The rapid growth of EdTech startups has introduced innovative tools that challenge traditional learning models, offering personalized, flexible, and technology-enhanced educational experiences. However, integrating these technologies into established educational institutions remains a complex and gradual process. This study aims to explore the impact of EdTech startups on traditional learning models, examining how these technologies disrupt, complement, or reinforce traditional pedagogical practices. Using a qualitative research design, the study employed semi-structured interviews, focus group discussions, and document analysis to gather data from educators, students, EdTech entrepreneurs, and administrators across urban centers in Indonesia. The findings reveal that while EdTech startups have the potential to enhance student engagement and learning personalization, their integration into traditional institutions is often hindered by infrastructural challenges, resistance to change, and a lack of digital literacy. The study highlights the role of the COVID-19 pandemic as a catalyst for accelerating EdTech adoption. In conclusion, the research underscores the need for a balanced approach that supports the professional development of educators, addresses equity in access to technology, and fosters collaboration between EdTech startups and traditional institutions. This study contributes to the growing literature on educational innovation, providing valuable insights for policymakers, educators, and EdTech developers seeking to integrate technology into learning environments effectively.

Keywords

Digital Learning, EdTech Startups, Educational Innovation, Technology Integration, Traditional Learning Models.

INTRODUCTION

In recent years, the rapid advancement of technology has significantly transformed various sectors, including education. The emergence of educational technology (EdTech) startups has introduced innovative tools and platforms that challenge the traditional paradigms of teaching and learning [1]. These startups have leveraged digital solutions to offer flexible, scalable, and personalized educational experiences that reshape how students access, consume, and engage with knowledge. From learning management systems and gamified learning platforms to AI-driven tutoring and adaptive learning software, EdTech innovations are redefining the boundaries of education, pushing institutions to reconsider the efficacy and relevance of conventional classroom-based instruction [2].

However, despite the promises offered by EdTech, integrating such technologies into mainstream education systems is far from seamless. Traditional learning models, which are largely characterized by face-to-face instruction, standardized curricula, and teacher-centered approaches, often struggle to adapt to the fast-paced changes introduced by these startups [3]. Issues such as resistance to change, lack of digital infrastructure, disparities in digital literacy, and questions about the pedagogical effectiveness of technology-enhanced learning continue to pose significant challenges. Moreover, many educational institutions remain cautious about fully adopting EdTech due to concerns about data privacy, equity of access, and the long-term sustainability of startup-driven models [4].

One of the unique aspects of this research lies in its focus on the dynamic interaction between EdTech startups and traditional learning institutions. While existing literature has extensively explored the advantages and disadvantages of educational technology in general, fewer studies have delved into how startup-driven innovations specifically disrupt, complement, or integrate with established learning systems [5]. This study examines how these new educational actors provide alternative learning pathways and influence pedagogical practices, institutional policies, and learner expectations. This intersection between innovation and tradition, agility and stability, forms the core of this investigation [6].

There remains a noticeable gap in the literature regarding how different stakeholders, educators, learners, policymakers, and EdTech entrepreneurs perceive the evolving role of technology in education, particularly in contexts where traditional models still dominate. Much of the existing research tends to be either overly optimistic, portraying EdTech as a panacea for all educational woes, or overly critical, emphasizing its limitations without adequately acknowledging the potential for synergy [7]. Furthermore, many prior studies focus on either K-12 or higher education exclusively without addressing the broader systemic impact that EdTech startups may have across the entire educational continuum. This research addresses these gaps by offering a balanced, multi-perspective analysis of how EdTech startups reshape traditional learning environments [8].

The primary objective of this study is to investigate the extent to which EdTech startups influence, challenge, or reinforce traditional learning models. Specifically, the research aims to

identify key areas of transformation, such as curriculum delivery, assessment methods, student engagement, and teacher roles. By examining case studies of prominent EdTech startups and their partnerships or tensions with educational institutions, the study seeks to highlight both the opportunities and challenges posed by this technological evolution. Additionally, it explores how the COVID-19 pandemic accelerated the adoption of EdTech solutions and whether this shift represents a temporary adaptation or a more permanent change in the educational landscape.

Ultimately, this research aspires to contribute to a more nuanced understanding of the EdTech-traditional education relationship, moving beyond binary narratives of disruption or resistance. The findings are expected to inform educators, policymakers, and EdTech developers on better navigating the complexities of educational transformation. By identifying best practices, common pitfalls, and potential frameworks for collaboration, the study hopes to support the development of hybrid learning models that combine the strengths of traditional and tech-enhanced approaches. In doing so, it offers a vision for an inclusive and adaptable education system better equipped to meet the diverse needs of 21st-century learners.

The intersection between EdTech startups and traditional learning models represents one of the most pressing and promising areas of inquiry in contemporary educational research. As digital tools become increasingly embedded in everyday life, understanding their impact on education is essential for shaping future-ready learning environments. Through a critical and comprehensive examination of this evolving relationship, this study aims to offer valuable insights into how innovation can coexist with tradition to foster more effective, equitable, and engaging educational experiences for all.

METHODS

This study employs a qualitative research design to explore the impact of EdTech startups on traditional learning models. The qualitative approach is suitable as it allows an in-depth understanding of participants' perspectives, institutional experiences, and the nuanced interactions between technological innovation and pedagogical practices. The research was conducted over four months, from August to November 2024, across three major urban centers in Indonesia: Jakarta, Bandung, and Yogyakarta. These cities were selected due to their diverse educational landscapes and the active presence of traditional institutions and emerging EdTech companies. The study focused on purposive sampling, targeting key stakeholders, including educators, EdTech startup founders, school administrators, and students who have directly experienced blended or technology-supported learning environments.

Data collection methods included semi-structured interviews, focus group discussions (FGDs), and document analysis. Interviews and FGDs were conducted in person and via virtual platforms to accommodate participants' availability and geographic location. Each interview lasted approximately 45–60 minutes, while FGDs ranged from 90 minutes to two hours. Data were collected from 25 participants, ensuring a range of voices from both

traditional and technology-driven educational settings. The primary data sources were interview transcripts, institutional reports, startup documentation, and relevant policy frameworks. Data were analyzed using thematic analysis, following Braun and Clarke's six-phase method: familiarization with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. The analysis was assisted by using NVivo software to manage and categorize qualitative data efficiently. To enhance the credibility and trustworthiness of the study, triangulation across data sources and member-checking with select participants were employed throughout the research process.

FINDINGS AND DISCUSSION

Findings

The data analysis collected through interviews, focus group discussions (FGDs), and document reviews revealed several key themes regarding the impact of EdTech startups on traditional learning models. These findings highlight the opportunities and challenges of integrating new technological innovations into conventional educational structures. The three main themes identified in the data were pedagogical transformation, institutional adaptation, and stakeholder perceptions of technology in education.

Pedagogical Transformation emerged as one of the most significant areas of change. The participants observed that EdTech startups have introduced various digital tools and platforms that facilitate personalized learning experiences. These tools, such as adaptive learning software, learning management systems (LMS), and gamified platforms, enable students to learn at their own pace and according to their needs [9]. Many educators acknowledged that these tools complement traditional teaching by providing additional resources and enhancing student engagement through interactive content. However, while there was widespread agreement that these technologies have the potential to enrich the learning experience, challenges regarding their pedagogical integration remained. Traditional methods of teaching, particularly lecture-based instruction, were still prevalent, and some educators expressed concerns that technology was being used as an add-on rather than a transformative force in their teaching practices. The analysis also showed that, although technology has been adopted, its integration was often superficial, with many teachers using EdTech primarily for administrative purposes or to deliver content without fully embracing its interactive and personalized potential [10].

Another critical theme identified was institutional adaptation. Traditional educational institutions, especially those in public sectors, displayed varying readiness levels to integrate EdTech solutions. Some institutions, particularly private schools and universities, were more proactive in adopting EdTech due to their financial resources, flexible policies, and willingness to innovate [11]. These institutions were seen as more open to experimenting with hybrid models that blended in-person and digital learning. In contrast, public schools, especially in rural or underprivileged areas, faced significant barriers to integrating EdTech effectively.

Major constraints include insufficient technological infrastructure, lack of digital literacy among teachers and students, and limited Internet access to devices [12].

Additionally, administrative resistance to change, often due to the perceived risks and costs associated with new technology, contributed to the slow pace of adaptation. Despite these barriers, some institutions reported gradual changes in mindset, with a growing recognition of the importance of digital tools in enhancing education. This shift was particularly evident following the COVID-19 pandemic, which catalyzed the widespread adoption of online learning platforms, even in traditionally conservative educational systems [13].

The third prominent theme from the data was stakeholder perceptions of technology in education. Teachers, students, and EdTech entrepreneurs all had distinct views on the role and value of technology in education. Teachers were generally positive about the potential for EdTech to support personalized learning and provide tools for differentiated instruction [14]. However, many teachers felt underprepared to use these technologies effectively, expressing concerns about their ability to integrate new tools into their curriculum. On the other hand, students were more enthusiastic about EdTech, often highlighting how it made learning more engaging, accessible, and flexible. They appreciated the ability to learn at their own pace and the opportunity to explore subjects in greater depth through interactive platforms [15]. However, some students also raised concerns about the lack of human interaction and the potential for technology to be overused, leading to feelings of isolation and disengagement.

EdTech entrepreneurs, on their part, viewed their role as central to the transformation of education. They believed that their innovations had the power to disrupt traditional education models, making learning more accessible, inclusive, and adaptable to the needs of modern students [16]. However, they also acknowledged the challenges they faced in collaborating with traditional institutions, particularly in overcoming institutional inertia and convincing educators of the long-term benefits of their products. While many EdTech startups expressed optimism about the future, there was a common sentiment that the education system was slow to embrace change and that more effort was needed to demonstrate the effectiveness of their solutions in improving educational outcomes [17].

Additionally, the analysis revealed that the COVID-19 pandemic played a pivotal role in accelerating the adoption of EdTech solutions, particularly in traditional educational institutions. The sudden shift to online learning forced many schools and universities to adopt digital tools, some of which had previously been resisted. This forced digital transformation led to significant learning curves for educators and students [18]. However, the pandemic also highlighted the potential for EdTech to address educational gaps, especially regarding accessibility, as it allowed for remote learning in situations where physical attendance was impossible. Despite the initial challenges, the experience of remote learning during the pandemic increased the willingness of educators and students to embrace hybrid learning models, even in the post-pandemic phase [19].

The findings of this study suggest that while EdTech startups play an increasingly significant role in transforming traditional learning models, the path toward full integration is complex and fraught with challenges. These challenges range from infrastructural barriers and resistance to change in educational institutions to concerns over the pedagogical effectiveness of technology-driven approaches. Nevertheless, the research also highlights the potential for a more hybrid educational model that combines the strengths of traditional teaching methods and EdTech innovations. As such, there is an ongoing need for collaboration between EdTech entrepreneurs, educators, and policymakers to develop frameworks that support technology integration in ways that enhance, rather than replace, traditional learning models.

Table 1. Comparison Between Traditional Learning Models and EdTech Approaches

No	Aspect	Traditional Learning Model	EdTech-Based Approach
1	Learning Environment	Classroom-based, face-to-face	Online or blended (hybrid)
2	Instruction Style	Teacher-centered	Student-centered, personalized
3	Access to Resources	Physical textbooks, limited school hours	24/7 access via apps and digital platforms
4	Assessment Methods	Periodic exams and written assignments	Continuous, real-time feedback and analytics
5	Pace of Learning	Uniforms for all students	Adaptive and self-paced
6	Technology Integration	Minimal or administrative use	High, central to delivery and learning
7	Scalability and Reach	Limited to classroom or institution	Can scale nationally/globally via the internet

Table 1 This table highlights the key contrasts between conventional education systems and the innovations introduced by EdTech startups. While traditional models focus on teacher-led instruction within structured environments, EdTech promotes flexibility, personalized learning, and broader access to education. One of the biggest shifts lies in the learning experience from passive knowledge reception to active and adaptive engagement. Furthermore, EdTech enables data-driven decision-making through real-time student performance tracking, which traditional methods often lack. The table serves to visualize how EdTech startups are not merely adding tools to education but reshaping its core practices, philosophies, and delivery mechanisms. It also reinforces the need for strategic integration to maximize the benefits of both models in a hybrid future.

Discussion

The findings of this study on the impact of EdTech startups on traditional learning models reveal several key transformations and challenges that align with, as well as challenge, previous research in the field. One of the central themes from our findings—**pedagogical transformation**—suggests that while EdTech has the potential to enhance personalized learning and student engagement, its actual integration into traditional classrooms remains limited. This supports earlier studies by [20], who argue that digital learning tools can improve individual learning experiences. Still, such integration is success heavily depends on teachers'

ability to adapt to new pedagogical methods. Our research found that many educators still relied on traditional instruction methods and used EdTech primarily for content delivery rather than for more innovative, student-centered practices. This finding aligns with the concerns raised by [21], who noted that technological tools often fail to disrupt traditional educational practices when teachers do not have sufficient training or support to integrate them effectively into their teaching.

Moreover, the institutional adaptation theme, which emerged as a critical factor in the study, provides insight into the varying degrees of readiness for EdTech adoption across educational institutions. Similar to previous research findings [22], this study highlights that private institutions with greater resources and flexibility were more open to experimenting with EdTech solutions. This contrasts with public schools, where technology integration faced significant barriers, including lack of infrastructure and resistance from teachers and administrators. This finding resonates with the work of [23], who highlighted the concept of institutional inertia, the tendency of organizations to resist change due to established structures, routines, and vested interests. As demonstrated by our research, public institutions were often reluctant to embrace technological innovations, citing concerns about costs and the potential disruption to their established practices. However, this study also reveals that the COVID-19 pandemic catalyzed overcoming some of these institutional barriers, prompting even traditionally resistant schools to adopt online learning solutions. This finding echoes research by [24], who observed that the pandemic acted as a "disruptive event" that accelerated digital transformation in education.

Regarding stakeholder perceptions of technology in education, the findings from this study reveal nuanced attitudes toward EdTech among teachers, students, and EdTech entrepreneurs. Teachers generally viewed technology as a useful tool for enhancing student engagement but felt unprepared to leverage it in their pedagogy fully. This concern aligns with previous studies by [25], which found that teachers' attitudes toward technology are often shaped by their confidence and comfort with the tools. Similarly, our findings underscore the need for professional development and ongoing support for educators to overcome these barriers. On the other hand, students were more enthusiastic about EdTech, appreciating its flexibility and engagement opportunities. This contrasts with the views of some educators, who expressed concerns that technology could lead to a loss of human interaction and undermine the social aspects of learning. This division in perceptions is consistent with the dual perspectives on technology integration discussed by [26], who suggested that while technology can enhance learning outcomes, it must be balanced with face-to-face collaboration and relationship-building opportunities.

From the perspective of EdTech entrepreneurs, our study revealed a sense of optimism about the potential for technology to disrupt traditional education, but also an acknowledgment of the challenges in persuading educational institutions to adopt their innovations. This finding aligns with the work of [27], who emphasized the "disruptive innovation" theory, suggesting that new technologies often face resistance from established

players in a given market. The difficulty in gaining traction with traditional educational institutions was echoed by the EdTech entrepreneurs we interviewed, who expressed frustration with the slow pace of adoption and the barriers to collaboration with public schools and universities. This resistance from traditional educational institutions is consistent with the challenges described by [28], who argued that educational incumbents are often more focused on maintaining their existing models rather than embracing potentially disruptive technologies.

In addition, the analysis of COVID-19's role in accelerating EdTech adoption mirrors findings from other studies conducted during the pandemic. For instance, studies by [29] found that the abrupt transition to online and hybrid learning forced educators and institutions to quickly adapt to digital tools, with varying degrees of success. Our research extends these findings by illustrating that the pandemic pushed institutions to adopt EdTech and highlighted the digital divide between wealthy and underprivileged institutions. While private and well-resourced schools were able to pivot to online learning quickly, public institutions with fewer resources struggled to provide equitable access to digital education. This reinforces earlier research by [30], who emphasized that unequal access to technology exacerbates educational inequalities.

The theoretical framework used in this study, namely, the Diffusion of Innovations Theory by [31], provides a useful lens through which to understand the adoption of EdTech in traditional education systems. Rogers' model suggests that adopting new technologies follows a predictable process, starting with early adopters and gradually spreading to the wider population. Our findings reflect this pattern, with private institutions and forward-thinking educators serving as early adopters of EdTech tools while public institutions lagged [32]. However, the rapid spread of online learning during the pandemic demonstrates the potential for an accelerated diffusion process, particularly in times of crisis. This aligns with Rogers' argument that "crises" often catalyze rapid innovation adoption, particularly in traditionally resistant sectors to change.

The findings of this study offer a comprehensive view of how EdTech startups impact traditional education models. While these innovations have substantial potential to transform pedagogy and institutional practices, challenges related to teacher readiness, institutional adaptation, and equity in access to technology remain significant. These findings resonate with existing research and theoretical frameworks, providing a deeper understanding of the dynamics between innovation and tradition in education. Future research should continue to explore how EdTech can be more effectively integrated into mainstream education, particularly in addressing the digital divide and enhancing teacher training to ensure that technology is used in ways that complement and enhance traditional learning models.

CONCLUSION

This study aimed to explore the impact of EdTech startups on traditional learning models, addressing how emerging technologies can transform established educational

systems. The findings reveal that while EdTech has the potential to enhance student engagement and personalized learning experiences significantly and offer innovative pedagogical solutions, its integration into traditional institutions is still met with considerable resistance. Traditional education systems, particularly in public schools, often struggle with infrastructure challenges, digital illiteracy, and the inertia of established practices, making it difficult for EdTech to disrupt or complement existing models fully. These insights underscore the complexity of integrating innovation into traditional educational frameworks, highlighting the need for a more nuanced approach that accounts for institutional readiness, teacher training, and equitable access to technology.

However, this research is not without its limitations. The study focused on a small, purposively selected sample of institutions in specific urban centers in Indonesia, which may not represent the broader educational landscape. Additionally, relying on qualitative methods means that the findings may not be generalizable to all educational contexts, especially those in rural or underserved areas. Future research should consider longitudinal studies that track the long-term effects of EdTech adoption on educational outcomes and institutional change. Furthermore, it would be beneficial to investigate the experiences of students and educators in rural or low-resourced settings to gain a more comprehensive understanding of the barriers and opportunities for EdTech integration. Finally, future studies could explore the effectiveness of hybrid learning models that combine traditional and digital methods, examining the potential for sustained collaboration between EdTech startups and traditional educational institutions to create more inclusive and adaptive learning environments.

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